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Disease Reaction of Sorghum Hybrids to Infection by Maize Dwarf Mosaic Virus Strain A

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Maize dwarf mosaic of sorghum, *Sorghum bicolor* (L.) Moench, is caused by maize dwarf mosaic virus (MDMV). Infection of sorghum by MDMV produces variable symptoms depending on virus strain, plant genotype, and temperature. Infection causes a yellow to dark green pattern (mosaic) and, on certain genotypes, a necrotic reaction (red-leaf) develops when the temperature drops below 21C (69 F). Hybrids expressing the mosaic reaction when the temperature drops show less reduction in yield than plants with red-leaf symptoms. Immunity to MDMV is not present in commercially available hybrid sorghums tested.

Procedure

Studies were conducted at the Fort Hays Experiment Station. All sorghum hybrids were tested under both greenhouse and field conditions. In greenhouse tests, sorghum hybrids were planted in metal flats with 15 seeds/entry and 33 entries/flat. Seedlings were inoculated in the two-leaf stage with a Devilbiss atomizer (7.0 kg/cm²- 100 lbs/in² air pressure). Inoculated plants were maintained at 27 ± 4C (80 ± 4F) in the greenhouse. Control plants, inoculated with buffer and abrasive only, were maintained in the same environment.

The presence of mosaic symptoms was noted 14 days following inoculation. Test plants were then

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placed in a growth chamber at 15C (59 F). Four days later plants were returned to the greenhouse and the presence of red-leaf symptoms was noted. Greenhouse tests were repeated three times.

Field-grown plants in the two- to three-leaf stage were inoculated with a Devilbiss EGA-502 spray gun attached to a 3.5L (1 gal) inoculum reservoir. Compressor line pressure was maintained at 7.0 kg/cm²(100 lbs/in²). Notes on red-leaf development were recorded at weekly intervals during the growing season beginning 2 weeks after inoculation. Planting was delayed until late June to assure cool temperatures for induction of red-leaf necrosis.

Results

Reactions of all hybrids tested are shown in the following table. Symptoms in sorghum other than those described may be due to infection by the B-strain of MDMV.

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Yield data for sorghum hybrids used in this study can be found in Report of Progress 465, 1984 Kansas Sorghum Performance Tests.

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Disease ^a			Disease		
Brand	Hybrid	Reaction	Brand	Hybrid	Reaction
Asgrow	Corral	M	Garrison	SG-925	M
Asgrow	Mustang	M	Garrison	SG-932	M
Asgrow	Opal	M	Garst	5319	M
Asgrow	Topaz	M	Garst	5511	M
Asgrow	Colt	M	Garst	5521	M
Cargill	30	M	Garst	5517	M
Cargill	40	M	Garst	5715	M
Cargill	55	RL	Golden Acres	T-E Y-44R	M
Cargill	60	M	Golden Acres	T-E Y-45G	M
Cargill	70	M	Golden Acres	T-E Y-60	RL
Cargill	80	M	Golden Acres	T-E Y-77	M
Conlee	Tophand II	M	Golden Acres	T-E Y-101G	M
Conlee	Tophand TA	M	Golden Acres	T-E Dinero	M
Conlee	Rawhide	M	Golden Acres	T-E Dinero E	M
Conlee	Pronto	M	Golden Acres	T-E Tuff	M
Cross	C1-100A	M	Golden Harvest	H-510B	M
Cross	C1-112A	M	Golden Harvest	H-514B	M
Cross	C1-120A	M	Gold Tag	475	M
Cross	C1-125A	M	Gold Tag	565	M
Cross	C1-125R	M	Gold Tag	585	M
Cross	C1-303A	M	Growers	GSA 1180	M
Cross	C1-344A	M	Growers	GSC 1188	M
Dekalb	DK-39Y	M	Growers	GSA 1212	M
Dekalb	DK-38	M	Growers	GSC 1295	M
Dekalb	DK-42Y	M	Growers	GSC 1299	M
Dekalb	DK-46	M	Growers	GSA 1310A	M
Dekalb	DK-58	M	Hoegemeyer	GT 622	M
Dekalb	DK-59	M	Hoegemeyer	GT 657	M
Dekalb	DK-61	RL	Hoegemeyer	GT 665Y	M
Dekalb	DK-64	RL	Hoegemeyer	GT 679	M
Dekalb	DK-69	M	Hoegemeyer	GT 688	M
DeLange	DS-A121	M	Horizon	101G	M
DeLange	DS-A131	M	Horizon	104G	RL
DeLange	DS-G686	M	Horizon	114G	M
DeLange	DS-G922	M	Jacques	308	M
DeLange	DS-G932	M	Jacques	377W	RL
Farm Bureau	FB 155A	M	Jacques	397W	RL
Farm Bureau	FB 301	M	Jacques	404	M
Farm Bureau	FB 301A	M	Jacques	408	M
Farm Bureau	FB 601	M	Jacques	505	M
Fontanelle	2233	M	Jacques	606	M
Fontanelle	3345	M	Keltgen	KG 57T	M
Fontanelle	4455	M	Keltgen	KG 60T	M
Fontanelle	5583	M	Keltgen	KG 63T	M
Fontanelle	6651	M	Keltgen	KG 70T	M
Funks	G-522A	M	Keltgen	KG 71D	M
Funks	G-522DR	M	Keltgen	KG 72D	M
Funks	G-550	M	Keltgen	KG 75T	RL
Funks	G-611	M	Lynks	555GBT	M
Funks	G-1400	M	Lynks	595GBT	M
Funks	G-1560	M	McCurdy	M51YG	M
Funks	G-1600	M	McCurdy	M57YG	RL
Funks	G-1711	M	McCurdy	M637	M
Garrison	SG-686	M	McCurdy	M687	M
Garrison	SG-688	M	McCurdy	M747	M
Garrison	SG-Y850R	M	MFA	GS 10	M
Garrison	SG-922	M	MFA	GS103	M

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Brand	Hybrid	Disease^a Reaction	Brand	Hybrid	Disease Reaction
MFA	GS301A	M	Seed Tec	694G	RL
MFA	GS384	RL	Seed Tec	D701G	M
NC+	160	M	Seed Tec	710DR	M
NC+	174	M	Seed Tec	716DR	M
N C +	178	M	Seed Tec	1002	M
NC +	271	RL	Stauffer	530G	M
Northrup King	2244	M	Stauffer	535GR	M
Northrup King	2456Y	M	Stauffer	657Y	M
Northrup King	2660	M	Stauffer	677G	RL
Northrup King	2778	M	Stauffer	708G	M
Northrup King	2779	M	Stauffer	734GR	M
ORO	G XTRA	M	Stauffer	S9533GR	M
ORO	Pronto	M	Stauffer	S9736	M
O'S GOLD	GS 709	M	Stauffer	S9750 GR	M
O'S GOLD	GS 712	M	Terra	HT 45G	M
O'S GOLD	GS 5100	M	Terra	HT 124	M
P-A-G	3339	M	Terra	HT 125G	M
P- A-G	3385	M	Terra	HT 126 DR	M
P A-G	4462	RL	Terra	HT 128 GDR	M
P- A-G	5514	M	WAC	652 G	M
P-A-G	5665	M	WAC	686	RL
Paymaster	1022	M	WAC	694 F	M
Paymaster	1091	M	WAC	D701 G	M
Paymaster	1099	M	WAC	710 DR	M
Paymaster	1125	M	WAC	1002	M
Paymaster	1195	M	Warner	W-628	RL
Pioneer	8222	M	Warner	W-628 DR	M
Pioneer	8300	RL	Warner	W-630 DR	M
Pioneer	8333	RL	Warner	W-655 T	M
Pioneer	8493	M	Warner	W-685 DR	M
Pioneer	8501	M	Warner	W-839 A	M
Pioneer	8515	M	Warner	W-839 DR	M
Pioneer	8585	M	Warner	W-851 A	M
Pioneer	8680	M	Warner	W-851 DR	M
Pioneer	8790	M	Warner	W-866 DR	M
Pioneer	8855	M	Weather Master	GS 56 YGR	M
Ring Around	RA 433A	M	Weather Master	GS 61 YGR	M
Ring Around	RA 787	RL	Weather Master	GS 66 YGR	RL
Ring Around	RA 808	RL	Wilson	614 G	M
RS	610	M	Wilson	617 G	M
Seed Tec	652G	M	Wilson	621 G	M
Seed Tec	672G	M	Wilson	623 G	M

^aDisease reactions are the some for both field and greenhouse tests.

^aM=Mosaic RL=Red Leaf

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